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Canada Thistle and Its Control

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CANADA THISTLE and its control

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Canada thistle,[2] a perennial weed, seriously reduces crop yields wherever sizable infestations occur.

Infestations occur throughout the northern half of the United States. As shown in figure 1, the Montana - Idaho - Washington - Wyoming area and the Minnesota-Wisconsin area have the most severe infestations. In Montana, Idaho, and Washington, Canada thistle is reported to cause heavier losses than any other perennial weed.

This weed can be controlled by cropping and cultural practices and by applying herbicides.

DESCRIPTION

Figure 2 shows the above ground part of a Canada thistle plant, part of the extensive root system, details of a flower, and seeds.

A mature plant is 2 to 5 feet tall. The leaves are 4 to 8 inches long.

Leaves are usually spiny, and edges are serrated and ruffled, as in figure 2. Occasionally plants without these leaf characteristics are seen. The margins may be spineless or smooth, or there may be various degrees of spininess and ruffling.

Flowers are three-fourths of an inch or less in diameter. They are borne at the ends of branches, which arise from the leaf axils. Most plants bear purple to rose flowers; white-flowered plants are found occasionally.

Seeds are one-sixteenth to one-eighth inch long. At maturity they are brownish, and each is attached to a small tuft of hairs.

GROWTH HABITS

Canada thistle propagates by seeds and by its potent horizontal and vertical root system.

Unless there is some interference—such as poor pollination—plants produce large quantities of seed each year. The seeds mature quickly after the flowers open and are capable of germinating in 8 to 10 days. Each seed by means of its attached tuft of hairs may be windborne for considerable distance and may start a new infestation.

Single plants have been known to spread 10 to 12 feet through the soil by root growth in one season. In the spring, new shoots arise from the extensive root system, and these become fully developed plants, with flowers, in 7 or 8 weeks. Thus, by root propagation alone, a newly

[1] Deceased.

[2] *Cirsium arvense* Scop.

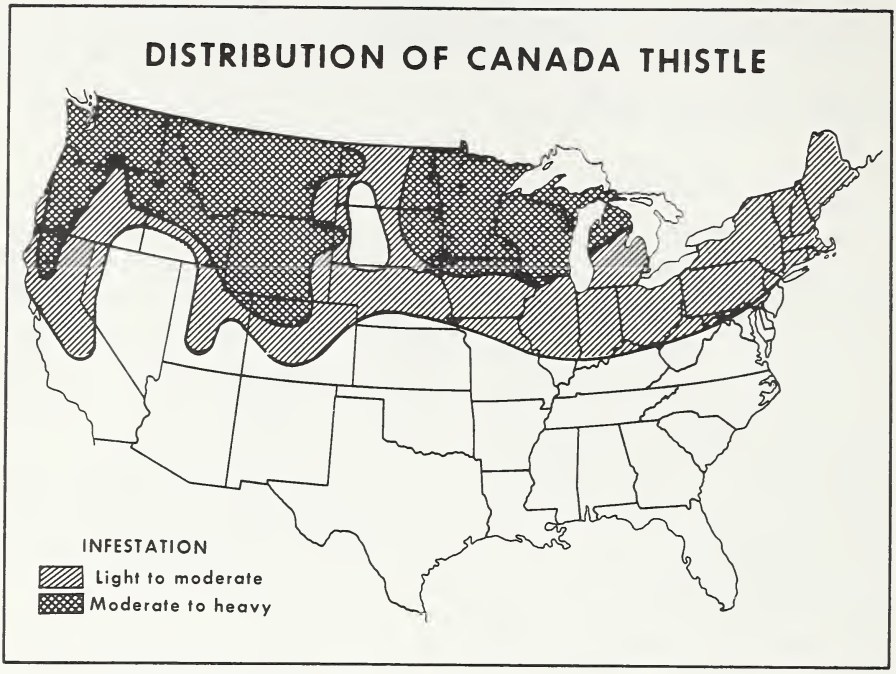

Figure 1.—Canada thistle distribution.

established plant may spread over a circular area 20 feet in diameter in 1 year.

When roots are cut or broken into pieces, each piece is capable of developing new plants and establishing a new patch.

These roots receive and store food reserves produced by the leaves. With the stored food reserves, Canada thistle has the ability to withstand a season of repeated cultivations that destroy the foliage.

ADAPTATION

Canada thistle is best adapted to areas where summer temperatures are moderate and where there is not too much moisture. The most favorable moisture conditions are furnished by an annual rainfall of 15 to 30 or more inches, or by irrigation. A high water table limits root development.

The weed grows well in a wide variety of soils, and spreads into new areas each year. Infestations are found, not only in cultivated fields, but also in pastures, on rangeland, in forests, along roadsides, rights-of-way, ditchbanks, and in lawns and gardens.

DAMAGE

Canada thistle damage crops by using light, moisture, and nutrients needed by the crops.

Perhaps the greatest losses occur in small-grain fields, where Canada thistle is ideally adapted to the cropping program. A sampling of yields in Montana wheatfields

Figure 2.—Canada thistle plant, including part of the extensive root system. Insets show details of a flower, and seeds.

showed this relation between density of infestation (number of Canada thistle shoots per square yard) and reduction in yield of wheat:

Number of shoots per square yard	*Reduction in yield (percent)*
2	15
12	35
25	60

Other crops seriously damaged by Canada thistle include peas, corn, beans, and sugarbeets.

Heavy infestations are common in pastures and ranges, where they reduce forage yields.

CONTROL

Three kinds of control measures for Canada thistle have been developed—cultural, cropping, and chemical.

The nature of the infestation that you wish to eliminate will determine which method should be used. In controlling infestations in crops, a combination of methods is usually advisable.

In any situation, elimination of Canada thistle requires vigorous, persistent control efforts.

Cultural Control

Cultivation.—Food reserves in the roots give Canada thistle its extraordinary capacity to survive. To eliminate an infestation by cultivation, start work when these reserves are low.

The reserves are normally at the lowest point of the year 4 to 6 weeks after emergence of the first plants (very early bud stage) in the spring. After this period, buildup of reserves in the roots is again under way, because shoots have developed the capacity to furnish food to the roots in amounts greater than the roots need for making new growth.

From 90 to 98 percent of a Canada thistle infestation can be eliminated by one season of cultivation begun at the low point of reserves and repeated every 21 days during the growing season. The remaining plants can be eliminated by continuing the cultivation a few times the next spring.

The first step is to plow and disk the land. Then cultivate 3, or 4 inches deep when the new shoots appear. A duckfoot cultivator with overlapping sweeps is an efficient tool for this work.

About 10 days after each cultivation new shoots usually emerge, and in another 10 or 15 days they are capable of furnishing food to the roots. The purpose of cultivating at 21-day intervals is to destroy newly emerged shoots just before they begin replenishing root reserves.

Deeper cultivation (more than 3 or 4 inches) makes it possible to lengthen the interval but is usually more costly. In July and August, when the weather is hot and dry, new shoots do not emerge so quickly. The interval may be extended to 28 days during such times.

Mowing.—Mowing of Canada thistle shoots weakens them. Where a heavy stand of competitive crop (such as alfalfa) is present, mowing is effective in decreasing the infestation if repeated two or more times in one season. Seed produc-

tion is prevented and the current year's growth is destroyed.

Cropping Practices

Perennial forage and winter annual cereal crops are the crops that compete most effectively with Canada thistle. They emerge early in the spring, and their presence inhibits the later-emerging Canada thistle shoots.

Some forage crops, particularly alfalfa, recover more quickly than Canada thistle after mowing and again have an advantage in competition. Perennial forage grasses behave somewhat like alfalfa but produce less cover, particularly in the summer.

Winter wheat and barley compete more effectively with Canada thistle than spring wheat or barley. Because of its perennial nature, the weed usually *increases* in the spring-planted grains.

Do everything practicable to promote growth of crops infested by Canada thistle, and thus give them a competitive advantage; for example, fertilize and irrigate adequately.

Chemical Treatments

2,4-D.—Large infestations of Canada thistle in small-grain fields and pastures and along roadsides, rights-of-way, and ditchbanks can be controlled by applying 2,4-D.

Treatment of an infestation with 2,4-D each year for 2 or 3 years usually eliminates most of the thistles.

This chemical is most effective if applied when:

- Canada thistle is in the early bud stage.
- Plants are actively growing.

This chemical should be applied to small grains after the four-leaf stage and before the late boot stage. After grain harvest, thistle regrowth should be treated again with 2,4-D, or it should be cultivated to prevent growth during the fall, which allows it to recover.

The rate at which 2,4-D should be applied in small-grain fields depends on the sensitivity of the grain crop and on the amount required to control the weed. Recommended rates differ throughout the Canada thistle region. In most areas, however, the rate is between ½ pound and 1½ pounds of 2,4-D per acre.

Thistle growth in grass pastures should be sprayed with 2,4-D at 1 to 2 pounds per acre. Repeated treatments for 2 or 3 years are necessary for a high degree of control.

To get rid of Canada thistle growing along roadsides, rights-of-way, and ditchbanks, spray with 2,4-D at the rate of 2 to 4 pounds per acre. Two sprayings a year are necessary in most areas. Spray the regrowth 3 or 4 weeks after it appears. Most of the Canada thistle is eliminated by 2 or 3 years of this practice.

MCPA.—MCPA is usually as effective as 2,4-D in controlling Canada thistle. It does less damage to oats and flax.

2,3,6-TBA.—Spraying with 2,3,6-TBA is a practical way to control smaller patches of Canada thistle. One application of 20 pounds per acre usually kills all the thistles, or

Figure 3.—Effect of spraying Canada thistle infestation in spring wheat. Left: Infestation sprayed with 2,4-D each year for 3 years. Right: Unsprayed. Both plots received nitrogen fertilizer each year.

most of them. The use of 2,3,6-TBA is restricted to spot treatments and noncrop areas. Fortunately, perennial grasses are somewhat tolerant of 2,3,6-TBA and usually recover on treated areas before weeds.

Amitrole.—A single application of amitrole may kill 85 percent or more of a Canada thistle infestation. Apply when thistles are in the bud to early bloom stage. Use 4 to 6 pounds of amitrole per acre on noncrop land. No. more than 4 pounds per acre should be used on cropland.

Certain preplanting and postharvest treatments may be quite effective for thistle control. Consult the label for limitations on the use of amitrole.

Picloram.—An application of 2 pounds of picloram per acre usually completely eliminates Canada thistle.

An application of ½ pound per acre often eliminates 75 percent of the weed. The lower rate is sometimes preferred to limit residue of picloram herbicide on treated soil.

Use picloram only on noncrop areas. Apply picloram any time during the growing season. Follow label instructions carefully.

Dicamba.—An application of 4 to 8 pounds of dicamba effectively controls Canada thistle. It should be applied on the foliage just before the weed blooms or on late fall regrowth.

Dicamba can be used on pasture and rangelands and on noncrop areas. Follow label instructions regarding handling and delay of grazing after treatment. Dicamba is active in the soil for a short time, however, and perennial grasses usually will grow on treated areas within a few months.

Soil Sterilants.—Several chemical soil sterilants can be used to control Canada thistle. These chemicals give almost complete eradica-

tion of thistle in one treatment. However, reinfestation often occurs from seed in the soil.

Most of the sterilants give best results when applied in September, October, or November.

Treatment of the soil with one of these sterilants usually kills all vegetation on the treated areas. The sterilant remains active in the soil for 1 to several years after application, thus limiting the agricultural use of the soil. In many situations, use of a sterilant increases erosion hazards in the treated areas.

Sodium chlorate is an effective sterilant against Canada thistle. It should be applied at 5 to 8 pounds per square rod. Soils are sterilized for 1 to 3 years, the period depending on soil characteristics and leaching. Sodium chlorate is hazardous to handle and is often combined with other herbicides.

It is sold under such names as Atlacide, Polyborchlorate, and Chlorea.[3] In using any of the chemicals mentioned in this bulletin, follow the instructions on the labels. These materials are limited to spot treatment and noncrop area use.

Methods in Combination

Using a combination of control methods is usually the most effective way to eliminate Canada thistle from cropland and at the same time maintain a high level of production. This means a planned program of cultivating, cropping, and spraying.

When small grains are planted, thistles should be sprayed with 2,4-D or MCPA, and the weeds should be cultivated or sprayed after harvest.

You can control Canada thistle in corn by taking these steps:

- In the spring, before planting corn, cultivate thoroughly.
- When corn is 10 to 15 inches high, spray the thistles with 2,4-D.

By growing alfalfa or alfalfa-grass crops in thistle-infested areas and mowing the crops regularly for hay, it is usually possible to elim-

[3] Trade names are used in this publication solely for the purpose of providing specific information. Mention of a trade name does not constitute a guaranty or warranty of the product named and does not signify that this product is approved to the exclusion of other comparable products.

CANADA THISTLE ON RANGELAND

Overgrazing of ranges and pastures often exposes them to invasion by Canada thistle.

Reduce thistle invasion by limiting grazing in the spring and at other times when necessary to promote vigorous growth of perennial grasses and forage plants. Early forage growth left ungrazed can compete with Canada thistle and keep down infestations. Areas left ungrazed for thistle-control purposes can be grazed later in the season.

You can control Canada thistle on ranges by applying 2,4-D at the rate of 1 to 3 pounds per acre, but the chemical will damage sensitive forage plants such as legumes.

inate 90 percent or more of the thistles in 3 years.

USE OF PESTICIDES

This publication is intended for nationwide distribution. Pesticides are registered by the Environmental Protection Agency (EPA) for countrywide use unless otherwise indicated on the label.

The use of pesticides is governed by the provisions of the Federal Insecticide, Fungicide, and Rodenticide Act, as amended. This Act is administered by EPA. According to the provisions of the Act, "It shall be unlawful for any person to use any registered pesticide in a manner inconsistent with its labeling." (Section 12(a)(2)(G))

EPA has interpreted this Section of the Act to require that the intended use of the pesticide must be on the label of the pesticide being used or covered by a Pesticide Enforcement Policy Statement (PEPS) issued by EPA.

The optimum use of pesticides, both as to rate and frequency, may vary in different sections of the country. Users of this publication may also wish to consult their Cooperative Extension Service, State Agricultural Experiment Stations, or County Extension Agents for information applicable to their localities.

The pesticides mentioned in this publication are available in several different formulations that contain varying amounts of active ingredients. Because of this difference in active ingredient the rates given in this publication refer to the amount of active ingredient, unless otherwise indicated in the publication. Users are reminded to convert the rate in the publication to the strength of the pesticide actually being used. For example, 1 pound of active ingredient equals 2 pounds of a 50% formulation.

The user is cautioned to read and follow all directions and precautions given on the label of the pesticide formulation being used.

Federal and State regulations require registration numbers on all pesticide containers. Use only pesticides that carry one of these registration numbers.

USDA publications that contain suggestions for the use of pesticides are normally revised at 2-year intervals. If your copy is more than 2 years old, contact your Cooperative Extension Service to determine the latest pesticide recommendations.

The pesticides mentioned in this publication were federally registered for the use indicated as of the issue of this publication. The user is cautioned to determine the directions on the label or labeling prior to use of the pesticide.

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